



Future nutrient load scenarios for the Baltic Sea due to climate and lifestyle changes

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Year: 2014
Journal: Ambio. 43 (3): 337-351

Abstract:

Dynamic model simulations of the future climate and projections of future lifestyles within the Baltic Sea Drainage Basin (BSDB) were considered in this study to estimate potential trends in future nutrient loads to the Baltic Sea. Total nitrogen and total phosphorus loads were estimated using a simple proxy based only on human population (to account for nutrient sources) and stream discharges (to account for nutrient transport). This population-discharge proxy provided a good estimate for nutrient loads across the seven sub-basins of the BSDB considered. All climate scenarios considered here produced increased nutrient loads to the Baltic Sea over the next 100 years. There was variation between the climate scenarios such that sub-basin and regional differences were seen in future nutrient runoff depending on the climate model and scenario considered. Regardless, the results of this study indicate that changes in lifestyle brought about through shifts in consumption and population potentially overshadow the climate effects on future nutrient runoff for the entire BSDB. Regionally, however, lifestyle changes appear relatively more important in the southern regions of the BSDB while climatic changes appear more important in the northern regions with regards to future increases in nutrient loads. From a whole-ecosystem management perspective of the BSDB, this implies that implementation of improved and targeted management practices can still bring about improved conditions in the Baltic Sea in the face of a warmer and wetter future climate.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3946118>

Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES)

Special Report on Emissions Scenarios (SRES) Scenario: SRES A1, SRES A2, SRES B1

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Quality

Food/Water Quality: Other Water Quality Issue

Water Quality (other): Total nitrogen; Total phosphorus; Eutrophication

Climate Change and Human Health Literature Portal

Geographic Feature: ☒

resource focuses on specific type of geography

Freshwater, Ocean/Coastal

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Region

Other European Region: Baltic Sea

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Other Projection Model/Methodology

Other Projection Model/Methodology: Nutrient loading

Resource Type: ☒

format or standard characteristic of resource

Research Article

Socioeconomic Scenario: Other Socioeconomic Scenario

Other Socioeconomic Scenario: Steady-state population growth and UN Medium Population Growth Scenario

Timescale: ☒

time period studied

Long-Term (>50 years)

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content